

In the Claims

Claims 1-8. (Previously canceled)

9. (Currently amended) A recombinant enzyme capable of hydrolyzing at least one organophosphate selected from the group consisting of carboxylester organophosphates and dimethyl-oxon organophosphates, wherein the recombinant enzyme ~~has~~comprises an amino acid sequence which is at least about 75% sequence identity with~~identical~~ SEQ ID NO.8, wherein the recombinant enzyme comprises amino acid residue conserved between the sequences provided in Figure 4 with the exception that the recombinant enzyme comprises and differs from SEQ ID NO. 8 at least in the substitution of Trp at position 251 with an amino acid selected from the group consisting of Leu, Ser. Ala, Ile, Val, Thr, Cys, Met and Gly at position 251.

10. (Previously withdrawn) A method of eliminating or reducing the concentration of organophosphate pesticide residues in a contaminated sample or substance in which the organophosphate is selected from the group consisting of carboxylester organophosphates and dimethyl-oxon organophosphates, the method comprising contacting the sample or substance with an enzyme encoded by a DNA molecule comprising a nucleotide sequence having at least 60% homology with LcαE7, in which the protein encoded by the DNA molecule differs from E3 at least in the substitution of Trp at position 251 with an amino acid selected from the group consisting of Leu, Ser. Ala, Ile, Val, Thr, Cys, Met and Gly.

11. (Previously withdrawn) A method of eliminating or reducing the concentration of organophosphate pesticide residues in a contaminated sample or substance in which the organophosphate is selected from the group consisting of carboxylester organophosphates and

dimethyl-oxon organophosphates, the method comprising contacting the sample or substance with a cell transformed with a DNA molecule comprising a nucleotide sequence having at least 60% homology with LcoE7, in which the protein encoded by the DNA molecule differs from E3 at least in the substitution of Trp at position 251 with an amino acid selected from the group consisting of Leu, Ser, Ala, Ile, Val, Thr, Cys, Met and Gly.

Claims 12 and 13 - (Previously canceled)

14. (Previously amended) The recombinant enzyme according to claim 9, wherein the DNA molecule encoding the recombinant enzyme has at least 80% homology with SEQ ID NO. 7

15. (Previously amended) The recombinant enzyme according to claim 9, wherein the DNA molecule encoding the recombinant enzyme has at least 95% homology with SEQ ID NO. 7.

16. (Previously amended) The recombinant enzyme according to claim 9, wherein the DNA molecule encoding the recombinant enzyme has the nucleotide sequence of SEQ ID NO:1, 3, or 5, or a sequence which hybridizes under high stringency conditions to SEQ ID NO. 1, 3 or 5, with the proviso that the recombinant enzyme encoded by the DNA molecule differs from SEQ ID NO. 8 at least in the substitution of Trp at position 251 with an amino acid selected from the group consisting of Leu, Ser, Ala, Ile, Val, Thr, Cys, Met and Gly.

17. (Previously amended) The recombinant enzyme according to claim 9, wherein said Trp at position 251 is substituted with Leu or Ser.

18. (Previously amended) A recombinant enzyme capable of hydrolyzing at least one organophosphate selected from the group consisting of carboxylester organophosphates and dimethyl-oxon organophosphates, wherein the recombinant enzyme has the amino acid sequence of SEQ ID NO.10 or the amino acid sequence of SEQ ID NO. 13 in which Trp at position 251 is replaced with Ser.

19. (Previously withdrawn) The method according to claim 10, wherein said DNA molecule has at least 80% homology with the DNA encoding LcαE7.

20. (Previously withdrawn) The method according to claim 10, wherein said DNA molecule has at least 95% homology with the DNA encoding LcαE7.

21. (Previously withdrawn) The method according to claim 10, wherein said DNA molecule has the nucleotide sequence of SEQ ID NO:1, 3, or 5, or a sequence which hybridizes thereto with the proviso that the protein encoded by the DNA molecule differs from E3 at least in the substitution of Trp at position 251 with an amino acid selected from the group consisting of Leu, Ser, Ala, Ile, Val, Thr, Cys, Met and Gly.

22. (Previously withdrawn) The method according to claim 10, wherein said Trp at position 251 is substituted with Leu or Ser.

23. (Previously withdrawn) A method of eliminating or reducing the concentration of organophosphate pesticide residues in a contaminated sample or substance in which the organophosphate is selected from the group consisting of carboxylester organophosphates and dimethyl-oxon organophosphates, the method comprising contacting the sample or substance with an enzyme encoded by a DNA molecule encoding a polypeptide having the amino acid sequence of RM-8Con shown in Fig. 1 or the amino acid sequence of Md α E7 shown in Fig. 3 in which Trp at position 251 is replaced with Ser.

24. (Previously withdrawn) The method according to claim 11, wherein said cell is a prokaryotic cell or an insect cell.

25. (Previously withdrawn) The method according to claim 11, wherein said DNA molecule has at least 80% homology with the DNA encoding Lc α E7.

26. (Previously withdrawn) The method according to claim 11, wherein said DNA molecule has at least 95% homology with the DNA encoding Lc α E7.

27. (Previously withdrawn) The method according to claim 11, wherein said DNA molecule has the nucleotide sequence of SEQ ID NO:1, 3, or 5, or a sequence which hybridizes thereto with the proviso that the protein encoded by the DNA molecule differs from E3 at least in the substitution of Trp at position 251 with an amino acid selected from the group consisting of Leu, Ser, Ala, Ile, Val, Thr, Cys, Met and Gly.

28. (Previously withdrawn) The method according to claim 11, wherein said Trp at position 251 is substituted with Leu or Ser.

29. (Previously withdrawn) A method of eliminating or reducing the concentration of organophosphate pesticide residues in a contaminated sample or substance in which the organophosphate is selected from the group consisting of carboxylester organophosphates and dimethyl-oxon organophosphates, the method comprising contacting the sample or substance with a cell transformed with a DNA molecule encoding a polypeptide having the amino acid sequence of RM-8Con shown in Fig. 1 or the amino acid sequence of Md α E7 shown in Fig. 3 in which Trp at position 251 is replaced with Ser.